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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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08/932,427 09/17/97 KITAMURA Y 1081.1055/JD

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TM02/0424

EXAMINER

PORTKA, G

ART UNIT

PAPER NUMBER

2187

DATE MAILED:

04/24/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
08/932,427

Applicant(s)
Kitamura

Examiner
Gary J. Portka

Art Unit
2187



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on Feb 9, 2001

2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1, 3-5, 7, 9-11, and 13-16 is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1, 3-5, 7, 9-11, and 13-16 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirements.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☒ The proposed drawing correction filed on Feb 9, 2001 is: a) ☒ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some* c) ☐ None of:

- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____.
- ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☐ Notice of References Cited (PTO-892)

18) ☐ Interview Summary (PTO-413) Paper No(s). _____

16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

19) ☐ Notice of Informal Patent Application (PTO-152)

17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 19

20) ☐ Other:

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DETAILED ACTION

1. Claims 6 and 12 have been canceled, and claims 1, 3, 7, 9, and 13-16 have been amended by Applicant. Claims 1, 3-5, 7, 9-11, and 13-16 are pending.

Information Disclosure Statement

2. The information disclosure submitted February 9, 2001 (paper no. 19) was considered.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1, 3-5, 7, 9-11, and 13-16 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1, 7, 14, and 15 recite plurality of disks storing a plurality of copies of each of logical volumes. Claim 13 recites first of the redundant logical volumes stored on a disk, and second of the redundant logical volumes stored on another disk. Claim 16 recites plurality of disks storing logical volumes. Applicant argues at page 9 of the response that a logical volume is as depicted in "The RAIDBook", where as shown in Figures 16 and 17 therein, a logical volume comprises a plurality of logical disks from different physical disks. That is, the logical volume spans multiple physical disks. This does not appear to coincide with Applicant's use of the term "logical volume". As shown in Applicant's Figure 1, LM0 comprises a logical volume, where

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the LM0 on disk 11-0 is one copy, and the LM0 on disk 11-1 is another copy. Therefore, the "plurality of copies" are on different disks, but each "copy of each logical volume" such as LM0 is only on one disk. It therefore appears that the disclosure intends each copy, such as LM0 on disk 11-0, to be interpreted as a recited "logical volume", in contrast to the claim language interpretation given in the arguments. Claims 3-5 and 9-11 incorporate the limitations of their respective independent claims and are similarly rejected.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1, 3-5, 7, 9-11, and 13-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1, 7, 14, and 15 recite plurality of disks storing a plurality of copies of each of logical volumes. Claim 13 recites first of the redundant logical volumes stored on a disk, and second of the redundant logical volumes stored on another disk. Claim 16 recites plurality of disks storing logical volumes. Since these limitations are inconsistent with Applicant's argued interpretation as described in the 35 U.S.C. 112/1 rejection above, they are vague and indefinite. Claim 1 recites "said logical volume" at line 21, 22, and 23, which lacks proper antecedent basis; claims 7, 13, 14, and 15 are similar. Claim 7 recites at line 18 "said memory" which lacks proper antecedent basis; claims 15 and 16 are similar. Claims 10 and 11 recite "a memory" where a memory was previously recited. Claim 11 recites "said identified logical volume", which lacks proper antecedent basis. Claim 15 at lines 4-5 recites "a designated logical volumes", which is vague

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since it is not clear whether there is one or more; claim 16 is similar. Claim 16 also recites "said program comprising" steps which follow; it would probably be more accurate to recite that the program "implements" or "performs" the steps rather than "comprises" them. All of these inconsistencies make these claims, and claims 3-5 and 9 which depend upon them, as vague and indefinite.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

8. Claims 1, 3-5, 7, 9-11, and 13-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Tanaka et al., U.S. Patent 5,542,064 (hereinafter "Tanaka").

9. As to claims 1, 7, and 13-16 Tanaka discloses a RAID apparatus and control method comprising:

a. Plurality of disk units (Drives 16-x) storing a plurality of copies of each of data of logical volumes ("identical data"), and disk controller (2) for accessing the disk units at the logical volumes (see Abstract, Figures 1-3, column 2 lines 14-17 and 54-67);

b. The disk controller including a memory storing number of request operations to each disk, and control means comparing these and selecting the disk having the least (see Figure 5, column

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6 line 62 to column 7 line 17, and column 8 lines 1-47), where the number is incremented/decremented for each new request/completion (see column 10 lines 19-24 and 44-49);

c. Wherein the disk units perform operations in a queued order (see column 4 lines 42-49, column 7 lines 33-53, and column 8 lines 1-5);

d. Wherein the memory stores the recited table indicating correspondence between disks and logical volumes (see Figure 3, and column 4 line 60 to column 5 line 27; each address designates a logical volume by either interpretation given under the 35 U.S.C. 112 rejections above, since for example as shown in Figure 3 logical address 2 designates a physical address at A1 that contains a plurality D1 of bytes on disk drive 1 (equals logical volume copy on one disk), but also designates the physical addresses A1, A2, and A3 on three disks (equals the logical volume that spans the disks)) and selection of the disk on which a logical volume is allocated by designation of the logical volume by a high-rank apparatus (CPU, see Abstract, selection indicated in Figure 3).

10. As to claims 3 and 9, Tanaka discloses channel adapter (4-x and 5) as claimed (see Figure 1, and column 3 lines 58 to column 4 line 1), device adapter (14 and 17-x) for accessing the disk units (see Figure 1 and column 4 lines 19-21), and resource manager circuit as claimed (including MP 11-x, see column 4 lines 13-24).

11. As to claims 4 and 10, Tanaka discloses the resource manager incrementing and decrementing number of operations of a disk unit (see column 10 lines 19-24 and 44-49).

12. As to claims 5 and 11, Tanaka discloses the memory stores status information for the disk units, for use in selecting a normal unit (see column 7 lines 4-9).

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Response to Arguments

13. Applicant's arguments filed February 9, 2001 have been fully considered but they are not persuasive. As described above in the rejections under 35 U.S.C. 112 paragraphs 1 and 2, the argued interpretation of "logical volume" appears to be inconsistent with how it is disclosed. The term "logical volume" is interpreted herein as a single contiguous unit on a single disk, while copies of this single contiguous unit also exist on other disks; this interpretation is consistent with Applicant's disclosure (see Figure 1). As further argued in the 35 U.S.C. 102 rejection above, the system of Tanaka may be seen as disclosing both interpretations of the logical volume. The logical address of Tanaka designates a plurality of physical addresses, both on one disk, and as copies on a plurality of disks.

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

15. **Any response to this final action should be mailed to:**
Box AF
Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

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(703) 308-9051, (for formal communications, please mark "EXPEDITED PROCEDURE")

or:

(703) 305-9731 (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Conclusion

16. Any inquiry concerning this communication from the Examiner should be directed to Gary J. Portka at telephone number (703) 305-4033. The Examiner can normally be reached on weekdays from 9:00 A.M. to 5:30 P.M.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Do Yoo, can be reached on (703) 308-4908. The fax phone number for this Group is (703) 305-9731.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, whose telephone number is (703) 305-3900.

GJP

Gary J. Portka
Patent Examiner
April 23, 2001

Do Hyun Yoo
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